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| 09/920,133 | 08/01/2001 | Kazunobu Kubota | 7217/65186 | 5686 |

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| EXAMINER |
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GRAHAM, ANDREW R

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| ART UNIT | PAPER NUMBER |
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2615

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/920,133

Applicant(s)

KUBOTA, KAZUNOBU

Examiner

Andrew Graham

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2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 21, 2005 has been entered.

Response to Amendment/Argument

2. Applicant's arguments filed November 21, 2005 have been fully considered but they are not persuasive.

On page 11, lines 11-14, the applicant has stated, "Thus, as seen in Fig. 2, the audio input signals 9 and 9a, are digitized and fed to B-format determination circuits which produce four channels of output signals X, Y, Z, and W. Therefore, it is seen that McGrath produces more signals at the output than at the input, whereas the present invention is the exact opposite and results in fewer output signals than originally input". The examiner respectfully disagrees. Though only two audio inputs are shown in Figure 2, multiple dots are shown below this illustrated set of inputs, teaching that more of such inputs are supplied to the system in the same manner and utilizing the same input components (such as 10,11, the output of which is applied to each of the four adders 12)(see also col. 6, lines 10-15).

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Counting the positively drawn inputs and the sets of inputs represented by dots or ellipsis, Figure 2 is indicative of at least seven inputs, though the underlying implication is that the number of inputs may be greater than two, including being unlimited. Thus, a number of inputs, wherein this number is greater than 4 (as is now presently claimed), is included in the teachings of McGrath. The claimed range (greater than 4, in view of 4 outputs of McGrath) overlaps with that taught by McGrath ('equal or greater than 2', or alternatively, 'at least seven') and is thus anticipated, wherein the five sets of dots are considered to provide the requisite "sufficient specificity" of 'greater than 2' or 'at least seven' (again noting the claimed "greater than M", in terms of McGrath, becomes "greater than 4" per the application of McGrath to the claimed groups). The fact that greater than two inputs are disclosed for the system is further evidenced by Figure 1, which shows three input audio arrows, well as the references to "microphones, prerecorded audio, etc" and "other inputs", notably plural, of col. 6, lines 1-15 as well as the "multiple inputs" of col. 7, lines 3-7. Again, so far as "greater than M" where $M=4$ is within or overlaps the range of "greater than 2" or, alternatively, is satisfied by the seven inputs taught by McGrath, the teachings of McGrath are considered to yet anticipate the pending claims.

Also, it is further noted that for the interpretation of such a limitation ("N is less than M"), for at least the purposes of Claim 1, just one or two of the formats (X or X,Y) could be interpreted as the

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claimed 'N groups', thereby allowing the two inputs of Figure 2 or the three inputs of Figure 1 of McGrath to yet anticipate pertinent claims, such as Claim 1. Regardless, McGrath is yet considered to teach "greater than 2 inputs" or "7 inputs", which would cover the situation of N=4, as is applied below, .

Drawings

3. The amendment made to the specification suffices to remove the basis of the previous objection(s) to the drawings. Accordingly, said objection(s) is hereby withdrawn.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-5, 7, 9-12, and 14-18 are rejected under 35 U.S.C. 102(b) as being anticipated by McGrath.

McGrath discloses a system for processing audio signal sources prior to the application of virtual positioning filtering.

Regarding **Claim 1**, McGrath teaches:

A method of processing an audio signal (Figure 1) comprising the steps of:

receiving plurality of M sound source signals (9,9a)(col. 5, line 66 - col. 6, line 13),

each of said sound source signals having attributes including at least one of position information, movement information, and

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localization position information (input sound is three dimensional, col. 4, lines 57-59; sources and their signals have associated direction of arrival, col. 5, lines 47-52; each of signals of sources have associated predetermined positions, as are implemented by 11, col. 6, lines 3-9 and 39-42; signals may also have associated relative movement, as evidenced by Doppler effect components, col. 6, lines 17-27);

arranging said M sound source signals in N groups (B-format X,Y,Z,W channels or components, 4 groups, effectively) based on the attributes of the M sound source signals so as to form grouped sound source signals (respective outputs of 11 from each input audio signal 9, 9a are applied to each adder 12, wherein each adder 12 represents a particular B-format channel, Figures 2-3; the amount of each signal involved or 'grouped' with each B-format channel is based on gain, which is at least set according to particular position of source, col. 6, lines 29-42; amount of signals involved or 'grouped' with each B-format channel also be adjusted based on an amplitude and direction of a reflection of signal sources, by the setting of delay, frequency response and gain of secondary taps, col. 6, lines 43-55);

where N is less than M (Figure 2, in view of col. 5, line 65-col. 6, line 15 and the audio inputs of Figure 1, at least teaches the number of inputs being "equal or greater than 2" or, alternatively, "seven", based on the number of dots in Figure 2; either interpretation overlaps or the range indicated by "N is less than M as

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claimed, wherein, for the purpose of this rejection, M is considered equal to "4")

storing the grouped sound source signals (channel information may be prerecorded, col. 5, lines 31-35);

providing control signals (yaw, pitch, roll data) having one of position information and movement information (data directly indicates position of headphone and indirectly movement information by current data relative to previous data; data enables position of head to be calculated relative to sound field (room) and XYZ locations of sound sources, col. 7, line 18- col. 8, line 15);

reading out the stored grouped sound source signals (application of WXYZ channels or components from prerecorded source noted above to rotation means 6, Figure 1); and

performing virtual localization processing on the read-out grouped sound source signals (from prerecorded 2) based on the control signals so as to produce left and right stereo signals (functioning performed by rotation of means 6 and conversion of means 8, col. 7, line 53 - col. 8, line 54).

Regarding **Claim 2**, McGrath teaches:

wherein said step of performing virtual localization processing is a virtual sound image localization for obtaining the left and right stereo signals supplied to a pair of acoustic transducers to localize sound image an arbitrary position around a listener (sound sources are located at desired position, corresponding signals are output over stereo headphones, col. 5, lines 55-64).

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Regarding **Claim 3**, McGrath teaches:

wherein said at least one of said attributes said sound source signals is changed by a change instruction ('instruction' of forwarding of current, measured roll, pitch, or yaw data, at least wherein the resulting, forwarded data comprises current data different than previously measured data, col. 5, lines 38-55; measuring of data at least changes direction of arrival characteristic associated with sound source, col. 5, lines 47-61).

Regarding **Claim 4**, McGrath teaches:

wherein said change instruction is supplied by a user's operation (forwarding of measured data, including measured data that differs, is based on user's handling of headphone or helmet, col. 5, lines 47-61).

Regarding **Claim 5**, McGrath teaches:

wherein said change instruction is obtained by detecting a movement of a listener's head (tracking of head produces yaw, pitch, roll data, including data that differs, col. 7, lines 18-26).

Regarding **Claim 7**, McGrath discloses:

wherein each number of groups of said N grouped sound source signals is two or greater (at least three channels, col. 5, lines 24-29),

at least one of said grouped sound source signals is based on the attribute of localization information (B-format signals are related to the direction of arrival from the sound source, col. 5, lines 47-52).

Regarding **Claim 9**, please refer above to the rejection of the similar limitations of Claim 1, noting that the values of the roll,

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pitch, and yaw data are utilized in the virtual positioning of the sources (col. 7, lines 22-65), which equates to "based on the control information".

Regarding **Claims 10-12**, please refer to the above rejection and grounds of rejection applied to the similar limitations of Claims 3-5, respectively.

Regarding **Claim 14**, please refer to the above rejection and grounds of rejection applied to the similar limitations of Claim 7.

Regarding **Claims 15 and 17**, please refer to the components in the system of McGrath involved with the implementation of the functions cited above as applied in the rejection of the similar limitations of Claim 1, including particularly those noted in column 5, lines 5, lines 40-46 and col. 10, lines 4-13. The suggested 'prerecorded' nature of the B-format signals for the system of McGrath, as cited in an above rejection, inherently teaches the involvement of some form of memory or memory means for storing the prerecorded digital B-format signals.

Regarding **Claims 16 and 18**, please refer to the above rejection and grounds of rejection applied to the similar limitations of Claim 2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6, 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGrath as applied above, and in further view of Wyse et al (WO 99/16049 A1).

As detailed above McGrath teaches a system for processing audio signals in order to synthesize a virtual audio sound field, wherein the sound field is reproduced through a binaural headphone output.

McGrath does not clearly specify:

- further comprising the step of supplying random fluctuations to at least one sound source signal of said M sound source signals and/or said grouped sound source signals.

Wyse teaches a system for modeling and producing audio sound effects for a video game sound field.

Regarding Claim 6, Wyse particularly teaches:

- the step of supplying random fluctuations to at least one sound source signal of said M sound source signals and/or said grouped sound source signals (added fluctuations, page 27, lines 7-25, in view of signal processing performed by component 11 for each input signal or to the component signal by means 6 or 8 in system of McGrath)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate random fluctuations as

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part of the signal processing of each input audio channel or a B-format channel in the system of McGrath, as is taught for the system of Wyse. The motivation behind such a modification would have been that such fluctuations would have avoided exact repetition of the sound source and achieved a natural effect for the sound.

Regarding **Claim 8**, McGrath in view of Wyse teaches:

steps of changing a video signal in response to changes of reproducing localization positions of said M sound source signals or said grouped sound source signals (synchronization of sound with visible items in video, page 30, lines 10-19 of Wyse, in view of use of system of McGrath with video game, col. 10, lines 22-27) and

outputting said video signals (output of video is inherent in view of elements, such as feet in Wyse, being visible, page 30, line 14).

Regarding **Claim 13**, please refer to the above rejection and grounds of rejection applied to the similar limitations of Claim 6.

Conclusion

6. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

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calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 571-272-7517. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AG

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March 16, 2006



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SUPERVISORY PATENT EXAMINER